Hazard Control Plan Cover Sheet

Work/Activity: Game Animal Sampling and Processing for the Foodstuffs Monitoring Program Identification Number: LANL-RRES-ECO-SF-HCP/OP-003, R4 **Author:** Phil Fresquez Signature Name Date **Initial Risk Level:** Low Consultation Concurrence __ Required Not Required Not Required Required Name (ECO Subject-Matter Expert) Signature (as required) Date Name (Independent Peer) Signature (as required) Date Safety Officer Signature Date Signature Team Leader Date Residual Risk Level: Minimal **Authorization of Work:** Group or Deputy Group Leader Signature Date

Next Review Date:

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1.0 INTRODUCTION

1.1 Background

A description of the Game Animal Monitoring Program is provided in the Foodstuffs Monitoring portion of the Environmental Monitoring Plan for 1999–2001 (LA-UR-99-1117).

1.2 In this Document

This procedure addresses the following major topics:

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1.3 History of Revision

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
0	10/4/96	New document
1	3/99	Reformatted in accordance with LIR300-00-01,
		Safe Work Practices
2	4/01	Added new Section 9.0, Training
3	4/02	Change in directorate.
4	4/03	Team name change to Environmental Surveillance.

2.0 PURPOSE

This Environmental Surveillance Team procedure describes the process for collecting and preparing samples from game animals (i.e., elk and deer) as part of the Foodstuffs Monitoring Program, as mandated by DOE Order 5400.1, 5400.5.

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3.0 SCOPE

This procedure applies to the individual(s) assigned to collect samples from game animals as part of the Foodstuffs Monitoring Program. The principle investigator (PI) is Phil Fresquez, the lead technician is Louis Naranjo, Jr., and the assistant is Rick Velasquez.

4.0 DEFINITIONS

4.1 Terms

<u>Foodstuffs</u>: produce (fruits, vegetables, and grains), fish (surface feeders and bottom feeders), eggs, milk, brewed tea, honey, and game animals (i.e., elk and deer).

5.0 RESPONSIBILITIES

5.1 Principle Investigator

PIs are responsible for

- Defining the components of and the processes associated with the work in sufficient detail to enable hazards to be identified and adequately controlled;
- Determining required training for workers;
- Ensuring that assigned workers are trained and meet authorization to work standards; and
- Ensuring that workers have the knowledge, skills, and abilities needed to perform the work safely.

5.2 Workers

Workers, with assistance as needed, are responsible for

- Identifying and evaluating the hazards associated with the work, as necessary, to ensure that the controls are adequate to perform the work safely;
- Defining, establishing, and maintaining, as assigned, a hazard-control system that
 effectively mitigates the hazards associated with the work and meets institutional
 and facility requirements;
- Determining that the work has been authorized before proceeding with it;
- Acquiring the knowledge and skills needed to perform the work;
- Obtaining and maintaining authorization to perform the work;
- Understanding and following all operational requirements and restrictions related to the work;
- Performing the work safely;
- Improving the safety of the work by reviewing the work, commensurate with the level of risk, and incorporating lessons learned;
- Using an appropriate change-control process to document and communicate changes made in the hazard control system; and
- Stopping the work if it seems to be unsafe.

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5.0 RESPONSIBILITIES (cont.)

5.3 Line Managers/ Supervisors

Line managers/supervisors are responsible for (cont.)

- Defining the scope of work;
- Ensuring that an effective hazard-control system is established to reduce the risk posed by the work to an acceptable level;
- A periodic review of the process used to assign and mitigate initial risk;
- Ensuring that institutional and facility requirements and restrictions on the work are followed;
- Authorizing the defined work, when the risk has been controlled to an acceptable level;
- Authorizing workers to perform the work, after they have documented adequate knowledge, skills, and abilities;
- Ensuring that workers perform the work safely;
- Improving the safety of the work by reviewing the work, commensurate with the level of risk, and ensuring the incorporation of lessons learned; and
- Ensuring that an appropriate change-control process is used to document and communicate changes made in the hazard-control system.

5.4 Subject Matter Experts

Not applicable to the procedures described in this document.

6.0 PRECAUTIONS AND LIMITATIONS

This document establishes the basic requirements for collecting game animal samples for the Environmental Monitoring Program. This procedure applies to all personnel performing field procedures described in this document. Work performed under this procedure by LANL personnel will occur only after all other applicable procedures have been reviewed and signed as listed under Section 7.0 of this document.

7.0 SAFE WORK PRACTICE REQUIREMENTS

7.1 Define the Work: Collection of Samples

<u>Project Personnel</u> - In accordance with the procedure for field work, a minimum of two people is required to go out in the field.

Sample Types - Game animal sampling is done on recently killed deer and elk. Samples are collected as deer and elk become available to the Contaminant Monitoring Team. In most cases, these animals have become available to RRES-ECO as road kill.

<u>Sample Locations</u> - Most samples are collected from on-site or perimeter areas of Los Alamos National Laboratory. Samples of elk and deer are also collected from regional (background) locations by the New Mexico Department of Game and Fish, and these samples are subsequently made available to the Soils and Foodstuffs Team.

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

Collection of Samples (cont.)

<u>Number of Samples</u> - The following table lists the approximate number of samples to be collected at on-site, perimeter, and regional locations:

	Muscle and/or Organs	Bone
On-site	1 to 5	1
Perimeter	1 to 5	1
Regional	1 to 5	1

<u>Equipment Needed</u> - Additional specific equipment required for going into the field is given in Attachment 1 of the operating procedure "General Field Work" (LANL-RRES-ECO-HCP/OP-001).

The following equipment is required for sampling:

- disposable plastic bags (e.g., trash bags)
- ice chest with ice
- knife
- chain-of-custody forms (see procedure LANL-RRES-ECO-HCP/OP-SF-008 and Attachment 1)

<u>Sampling</u> - Generally, information about road kill is made available to RRES-ECO by the local New Mexico Department of Game and Fish reserve conservation officers at the Lab. For each sample, perform the following steps:

Step	Action
1	Notify the proper authorities (<i>i.e.</i> , the Lab's Department of Game and Fish reserve conservation officers) if information about road kill has come from a different source. Currently, they are Tom Tucker (667-9844) and Manuel L'Esperance (667-1111).
2	Follow the procedure governing general field work (LANL-RRES-ECO-HCP/OP-001, R2). Check the condition of the vehicle and the fuel level before leaving for the field.
3	Travel to the sampling location to collect meat and bone for analysis. As reported locations may not be precise, carefully survey the area for the sample when approaching the site. Also, identify a safe place (<i>e.g.</i> , a turn-out next to the road) to stop the vehicle as close as possible to the animal.
4	With plastic gloves on, remove a sample of meat from the femur and/or shoulder areas with a clean, sharp knife. (Organs are taken from specimens given to us by the Game and Fish Department and not from roadside samples.)
5	Place the sample in a plastic bag and pack on ice for transport back to the laboratory. Complete a chain-of-custody form (Attachment 1) with the appropriate sampling information, and follow applicable chain-of-custody procedures for samples (refer to LANL-RRES-ECO-SF-HCP/OP-008, R2) until submitted to an analytical laboratory for analysis. We currently employ

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	Paragon Analytics, Inc., Fort Collins, CO.
6	Once at the lab, store the sample on ice or in a freezer until processing (normally within two working days).

7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

Processing of Samples

<u>Equipment Needed</u> - The following equipment is required for processing the samples:

- safety glasses and safety shoes
- lab coat and rubber gloves
- cutting boards, knives, and cut-resistant gloves
- balance
- bleach
- glass beakers (50-mL, 100-mL, 1-L, and 2-L volumes; one for each sample)
- aluminum foil
- hot-mitts/pot holders
- hot plate
- watch glass (one for each tritium sample)
- plastic wrap (e.g., Saran wrapTM)
- ice cubes
- drying and ashing ovens
- polyethylene bottles (20-mL and 500-mL volumes; one for each sample)
- zip-lock bags and labeling pens
- chain-of-custody tape

<u>Sample Processing</u> - Within two days of collection, process the samples by following the steps below:

Step	Action		
1	Carefully remove the skin and discard at the Los Alamos landfill. Remove the muscle from the bone. Muscle, bone, and organ samples will be processed according to the same procedures, but will remain as distinct samples.		
2	Assign ID numbers to samples, and label 1-L and 2-L beakers, polyethylene bottles, and bags with these numbers. Larger bags used for submitting samples should be labeled with sample location, date, time, and initialed.		
3	To obtain samples for tritium analysis, follow the steps below (refer to Attachment 2 for schematic of setup):		
	Begin by placing a 100-mL beaker upside-down in the center of a 1-L sample beaker, with a 50-mL beaker right-side-up on top of it. Fill the 50-L beaker with meat, bone, or organs.		
	Cover the top of the large beaker with a watch glass and seal with plastic wrap.		
	To aid in condensation of the water-sample, fill a beaker with ice and place it on top of the watch glass.		

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• Place the sample on a hot plate in the hood, warming at a low temperature until water begins to condense on the watch glass. Be certain that the condensation drips into the 50-mL sampling beaker. CAUTION!! Hot plate and glassware will become hot! Use care when handling these items.

7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

Processing of Samples (cont.)

To obtain samples for tritium analysis, follow the steps below (refer to Attachment 2 for schematic of setup) (cont.):

Step	Action		
3 (cont.)	To obtain samples for tritium analysis, follow the steps below (refer to Attachment 2 for schematic of setup):		
	 Collect about 10 mL of distillate from each sample, and carefully pour sample into labeled 20-mL polyethylene bottles. 		
	• Seal each bottle with chain-of-custody tape, and record each sample on the appropriate chain-of-custody form.		
	• Place all tritium samples and the chain-of-custody form into a labeled zip-lock bag and refrigerate until samples are submitted to Paragon Analytics, Inc		
4	Thoroughly wash muscle, bone, and organs to remove excess blood and/or debris. Use paper towels to pat-dry.		
5	 To obtain samples for heavy-metal analysis: Remove a 10-g (fresh weight) sample of muscle, bone, or organ. Place samples into labeled zip-lock plastic bags. Record all samples on a chain-of-custody form, place all samples for heavy metals into a labeled zip-lock bag, and freeze until submitted to Paragon Analytics, Inc. 		
6	All remaining samples will be used for radiochemistry analysis. CAUTION!! During drying and ashing procedures, ovens and glassware will become hot! Use care when handling these items.		
	Prepare the sample beakers:		
	• Weigh the 2-L beaker to determine the tare weight and record this value in the laboratory notebook.		
	• Place approximately 500 to 2000g of muscle, bone, or organ meat into the 2-L tared beaker and weigh to the nearest 0.01g to determine gross weight. Split a large sample into two beakers to serve as replicates for analysis.		
	• Record the fresh weight of the tissue (subtract the tare weight from the		

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gross weight) in the laboratory notebook.

Dry the samples:

- Cover each beaker with vented aluminum foil and place in the drying oven, carefully noting the placement-order of the beakers in the lab notebook.
- Dry the tissue in the beakers at about 75°C for 5 days.
- After the fifth day, weigh the samples to the nearest 0.01g. Continue drying and weighing the beakers each day until sample weights are constant (+10%) in two successive weighings.

7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

Processing of Samples (cont.)

<u>Sample Processing</u> - Within two days of collection, process the samples by following the steps below (cont.):

Step	Action		
6	Ash the samples:		
(cont.)	• When the samples are dry, remove them from the oven and weigh them to the nearest 0.01g. Subtract the original tare weight from this gross weight to calculate the dry weight of each sample. Enter this data in the laboratory notebook.		
	• Place samples in the ashing oven, <u>carefully noting placement of beakers</u> , and ash the samples for 5 days. During ashing, raise the temperature stepwise from 75°C to 500°C to avoid explosive combustion of the organic materials in the early stages of the process.		
	• After ashing is complete, reweigh the samples to the nearest 0.01 g. Calculate ash weights by subtracting tare weights from gross ash-weights. Record ash weights in the lab notebook.		
	Transfer each ash sample to a 500-mL polyethylene bottle and label the bottle.		
	Seal the bottles with chain-of-custody tape and record samples on a chain-of-custody form. Place all samples in a labeled zip-lock bag to be turned over to Paragon Analytics, Inc., with the appropriate chain-of-custody form.		
7	Clean the table top with soap and water after dissection of game tissue. Follow with diluted bleach to ensure (pathogen) contamination control.		
	Soak the beakers in soap and water and bleach. Rinse and place in automatic dishwasher.		

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Submittal of Samples

<u>Submitting the Samples</u> - Submit all samples to Paragon Analytics, Inc., for tritium, heavy metal, and radiochemical analyses.

Request the following analyses on the appropriate chain-of-custody forms:

- analysis of tritium content from liquid samples; reported in pCi/L of tissue moisture
- analysis of the following heavy metals from wet samples: Ag, As, Be, Cd, Cr, Hg, Ni, Pb, Sb, Se, Tl, and Zn (plus any others on EPA's Target Analyte List); reported in μg/g (wet weight)
- analysis of the following radionuclides from ashed samples: strontium-90, cesium-137, plutonium-238, plutonium-239/240, and americium-241; reported in pCi/g ash
- analysis of uranium; reported in ng/g ash

7.2 Identify and
Evaluate
Hazards

Hazard Initial Risk Level based on Severity and Likelihood

In the Field:

A) Off-road automobile accidents and tripping or falling hazards

LOW

B) Wildlife encounters (plague, hantavirus, ticks, etc.)

LOW

LOW

LOW

7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

	_	,	
7.2 Identify and Evaluate	<u>Hazard</u>	Initial Risk Level based on Severity and Likelihood	ı
Hazards (cont.)	In the Field (cont.)		
	C) Environmental hazards (weather)		LOW
	D) Oncoming vehicular traffic		LOW
	E) Lifting and moving heavy objects		LOW
	In the Laboratory		
	F) Use of electrical appliances (hot pla	tes and ovens)	LOW
	G) Hot and/or broken glass		LOW
	H) Splattering of hot water		LOW
	I) Drying and ashing ovens		LOW
	J) The Wiley Mill		LOW
	K) Use of knives		LOW

L) Contraction of wildlife blood-borne pathogensM) Repetitive motion and other ergonomic hazards

7.3 Develop and Implement Controls

7.3.1	Hazard	Hazard Control	Residual Risk Level
Development			

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A Off-road automobile accidents and tripping or falling hazards	LANL personnel will follow operating procedures discussing off-road vehicle use and tripping or falling hazards. Appropriate footgear and clothing will be worn by all LANL personnel. Personnel will have first aid/CPR training. Refer to the General Field Work HCP/OP.	MINIMAL
B Wildlife encounters (plague, hantavirus, ticks, etc.)	In accordance with recommendations set by the State of New Mexico Environmental Department, all personnel should wear long pants, long-sleeved shirts, and insect repellent. Do not handle dead or sick rodents. When you have returned from the field, perform a self-check for the presence of ticks. Refer to the General Field Work HCP/OP.	MINIMAL

7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)					
7.3.1 Development (cont.)	<u>Hazard</u>	Hazard Control	Residual Risk Level		
	C Environmental hazards (weather)	LANL personnel will cease operations during inclement weather as described in RRES-ECO operating procedures for conducting general fieldwork. All work will be performed within a safe distance to vehicles. The distance will be based on current field conditions and terrain with respect to current and expected weather conditions. Refer to the General Field Work HCP/OP.	MINIMAL		
	D Oncoming vehicular traffic	If you are collecting a sample from a roadkill on the side of a road, park your vehicle as close to the animal as possible and activate the hazard lights. Be cognizant of the fact that you are next to a road and be wary of oncoming traffic.	MINIMAL		
	E Lifting and moving heavy objects	Use carts and dollies. Use a helper.	MINIMAL		

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F Use of electrical appliances (hot plates and ovens)	Wear safety glasses, lab coat, steel-toe safety shoes, and rubber gloves. Be familiar with the operator's manuals for each piece of equipment.	MINIMAL
G Hot and/or broken glass	Wear safety glasses, lab coat, steel-toe safety shoes, and rubber gloves.	MINIMAL
H Splattering of hot water	Wear safety glasses, lab coat, steel-toe safety shoes, and rubber gloves.	MINIMAL
I Drying and ashing ovens	Use hot-mitts or pot holders when working with the ovens, hot-plates, or hot beakers.	MINIMAL
J The Wiley Mill	Wear safety glasses, lab coat, steel-toe safety shoes, and rubber gloves. Be familiar with the operator's manuals for each piece of equipment.	MINIMAL
K Use of knives	When knives are being used, cut-resistant gloves should be worn to prevent injuries.	MINIMAL

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of Workers

7.0 SAFE	WORK PR	ACTICE RE	QUIREMENTS	(cont.)
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7.3.1 Development (cont.)	<u>Hazard</u>	QUIREMENTS (cont.) <u>Hazard Control</u>	Residual Risk Level	
	L Contraction of wildlife blood-borne pathogens	Personnel responsible for processing samples will wear surgical gloves. All LANL personnel will follow procedures set forth by industry standard guidelines and will have completed the LANL bloodborne pathogens training and the RRESECO sponsored Zoonoses Awareness training. LANL personnel will perform all work in accordance with LIR402-530-00.1, Biological Safety. NMDGF personnel will adhere to appropriate operating procedures, including safety procedures, set forth by their respective permits or standard operating procedures.		
	M Repetitive motion and other ergonomic hazards	Take a short break every hour.	MINIMAL	
7.3.2 Documentation	All personnel assigned to participate in game animal sampling will have read this hazard control plan/operating procedure and will have signed an acknowledgment (Attachment 3).			
	Any future changes to this operating procedure will be properly documented and will be reflected by the revision number that is included with the document identification number.			
7.3.3 Authorization of Work	All LANL workers involved with this activity will obtain authorization from their direct supervisor, group leader, or deputy group leader. No work will be performed until this authorization has been granted. The residual risk level for performing activities related to this activity have been determined based on consultation with subject matter experts including contractor personnel and LANL personnel experienced in this type of procedure.			
	All work related to this activity will be reviewed, at a minimum, on an annual basis, and this document updated to reflect changes as deemed necessary.			
7.3.4 Authorization	LANL workers will be granted authorization to perform this work only after they have reviewed all appropriate required documentation and training that applies to LANL			

personnel. All contractor personnel will perform this work only after they have

provided proof of appropriate documentation that applies to contractor responsibilities.

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

7.4 Perform Work Safely

All personnel involved with this activity will adhere to all safety guidelines and procedures as described in the appropriate documents, including this document. Contractor personnel will be responsible for ensuring self-readiness checks before performing the work. LANL personnel will perform self-readiness checks before performing fieldwork. Field conditions, including weather conditions, will be evaluated as to the effect they will have on performing field activities safely. If activities can not be performed safely, all activities will cease until such time the LANL project leader authorizes work to resume.

7.5 Provide Feedback and Continuous Improvement

At a minimum, the activity described in this document will be evaluated annually. If any changes are made to the procedure, those changes will be evaluated as to whether or not they may introduce new hazards. Any new hazards will be evaluated and appropriate controls implemented to reduce their risk to an acceptable level. A periodic review with project personnel will be made to evaluate the accuracy of this document with respect to field operations.

8.0 RISK DETERMINATION

The determination of risk for each activity described in this document was based on the Risk Determination matrix given in LIR300-00-01, Safe Work Practices.

9.0 TRAINING

The following training must be completed and confirmed by the PI of the project before work can begin:

For each worker:

• General Field Work HCP/OP (LANL-RRES-ECO-HCP/OP-001) must be read and documented.

For each field crew:

- At least two people must have current First Aid Training.
- At least two people must have current CPR Training.
- Members must have site-specific training as required by the location where work is occurring.

10.0 REFERENCES

10.1 Source Documents

The following documents, which can be found in the Team Leaders (Phil Fresquez) Office located at TA-21, Building 210, Room 222, are referenced in this procedure:

- LA-UR-99-1117, "Environmental Monitoring Plan"
- LANL-RRES-ECO-HCP/OP-SF-008, "Chain-of-Custody for Environmental Samples"
- LANL-RRES-ECO-HCP/OP-001, "General Field Work"

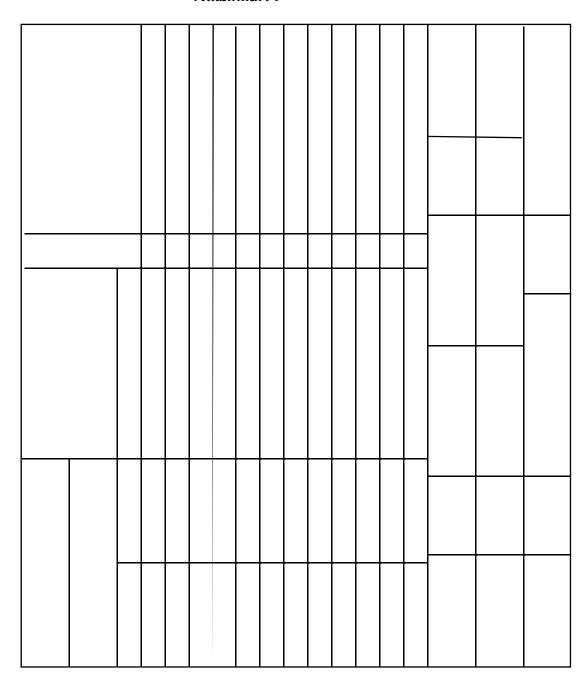
10.2 Document Coordination

RRES-ECO (Ecology Group) of the Risk Reduction and Environmental Stewardship Division is the group of institutional coordination responsible for developing, revising, and maintaining the contents of this document.

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ATTACHMENT 1: CHAIN-OF-CUSTODY RECORD

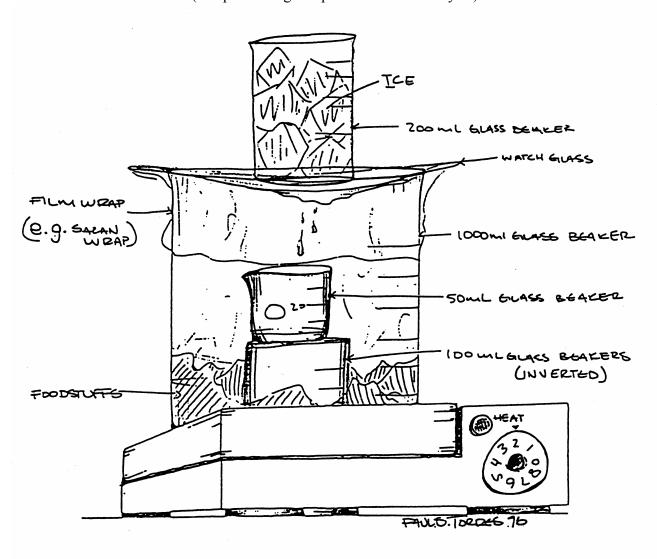
Attachment 1



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ATTACHMENT 2: SCHEMATIC OF DISTILLATION SETUP (For processing samples for tritium analysis)



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Attachment 3

Training Documentation Sheet

Hazard Control Plan/Operating Procedure Game Animal Sampling and Processing for the Foodstuffs Monitoring Program

I, the undersigned, have read and fully understand the Hazard Control Plan/Operating Procedure for game animal sampling and processing for the foodstuffs monitoring program. Signature_____Date____

Print Name_____

Supervisor's signature)

Date Self-Study Training

On-the-Job Training _____ Date _____ Date ______